

What is claimed is:

1. A self-propelled robot for movement over a surface to be treated, the robot comprising

a power supply (11);

a traction mechanism (6-9) receiving power from the power supply, for moving the robot over the surface;

a mechanism (16) for controllably depositing a fluent material on to the surface;

a plurality of navigation sensors (4,13,18,21) providing signals for enabling the robot to navigate over the surface;

one or more detectors adapted (14,15,17) to detect the presence of the material on the surface and provide signals indicative thereof; and

a control system (12,100) receiving the signals from the sensors and detectors, for controlling the traction mechanism and the depositing mechanism in dependence upon the signals received from the sensors and detectors.

2. A robot according to claim 1, wherein the navigation sensors include collision sensors comprising one or more lateral displacement sensors (4) arranged on a peripheral sensor ring (20) to provide 360° collision detection, and/or one or more vertical displacement sensors (18).

3. A robot according to claim 1 ~~or claim 2~~, wherein the detectors comprise one or more sensors (14,15) arranged to detect the edge of a section of previously deposited product.

~ 4. A robot according to ^{Claim 1} ~~any of claims 1 to 3~~, wherein the deposition detectors include one or more radiation sources and/or detectors, moisture detectors, reflectivity meters, conductivity meters.

- claim 1*
5. A robot according to ~~any of claims 1 to 4~~, wherein the control system (100) has a hierarchical architecture and includes one or more microprocessor controllers or microcontrollers (106) for controlling higher-level functions and providing higher-level instructions; and a plurality of lower-level function modules (101-104,114) adapted to receive signals from the sensors and detectors (4,13-15,17,18,21) and having processors to provide control signals in response thereto.
6. A robot according to claim 5, wherein the traction mechanism and product dispensing control signals are issued to a traction mechanism controller (112) and to a product dispensing controller (113) via a manifold or bus (111) arranged to receive signal inputs from the microprocessor(s) or microcontroller(s) (106) and from the lower-level function modules (101-104).
7. A robot according to claim 5 ~~or claim 6~~, wherein the lower level function module processors (101-104,114) include neural network functionality to provide behavioural characteristics appropriate to the chosen task of the robot, the behavioural characteristics of the processors being moderated by a group of generic moderators (111,29-32) providing arbitration between the control instructions from the various processors (101-104,114).
8. A robot according to claim 7, wherein the lower-level modules (101-104,114) comprise analog neural networks which provide functions selected from edge follow and dispense control functions, cliff sensing, collision detection, speed reduction and random movement functions.

9. A method for controllably depositing a fluent material on to floors, carpets and other floor coverings using an autonomous, self propelled, deposition-sensing and deposition rate-controlling robot.

10. A method according to claim 9, wherein the material deposited is a carpet cleaning composition, an odorization/deodorization composition, a dust mite control composition, an anti-microbial composition, a hard surface cleaning composition, or one of a number of compositions applied simultaneously, or successively.

11. A method according to claim 9 ~~or claim 10~~, wherein the material deposited includes a marker, the presence of which can be detected to provide detection of the extent of treatment material deposition.